TER-MARTIROSYAN, K. A.

"Theory of Nuclear Reactions with the Lighest Nuclei."

report submitted for All-Union Conf on Nuclear Spectrocopy, Tbilisi, 14-22 Feb 64.

ACCESSION NR: AP4019222 S/0056/64/046/002/0568/0577

AUTHORS: Ivanter, I. G.; Popova, A. M.; Ter-Martirosyan, K. A.

TITLE: Behavior of the cross section for the inelastic process $a + b \rightarrow c + d + e$ at high energies

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 568-577

TOPIC TAGS: inelastic scattering, high energy scattering, Regge pole, genuine inelastic collisions, almost elastic collisions, single Regge pole approximation, asymptotic reaction amplitude

ABSTRACT: Conversion of two particles into three is investigated in the region of very high energies, on the basis of the results of an analysis of the asymptotic amplitudes of the inelastic processes (K. A. Ter-Martirosyan, ZhETF v. 44, 341, 1963; Nuclear Phys., in press. A. M. Popova and K. A. Ter-Martirosyan, Nuclear Phys., in press). The results are based on the assertion that, if only the

ACCESSION NR: AP4019222

contribution of the Regge pole on the extreme right is included, then the asymptotic behavior is determined solely by the contributions from simple diagrams very similar to Feynman diagrams. The total cross section for the reaction consists of three terms, of which one determines the contribution from small momenta of particle d, the second makes a small contribution when the energy is very large and corresponds to events having a "shower" character, when both ultrarelativistic particles c and d are emitted in a narrow cone in the direction of the colliding particles and the momentum of particle c is much larger than the momentum of particle d. The last term corresponds to the case when the momenta of the particles c and d are almost parallel and their magnitudes are of the same order, corresponding to "almost elastic" collisions, whereas the collisions of the first two types are "genuine elastic collisions." The total cross section is found to have an energy dependence of the form $[c_1 \ln [\ln(s/m^2)] + c_2]/\ln(s/m^2)$ (s -- energy, m -- mass).

ACCESSION NR: AP4019222

The largest contribution to the cross section corresponds to the case of the so-called "genuine inelastic" collisions. In this case one of the two particles with the same direction has a much larger momentum than the other particle. Orig. art. has: 29 formulas and 4 figures.

ASSOCIATION: None

SUBMITTED: 21Jun63 DATE ACQ: 27Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 004

Card 3/3

ACCESSION NR: AP4031151 S/0056/64/046/004/1295/1306

AUTHORS: Verdiyev, I. A.; Popova, A. M.; Ter-Martirosyan, K. A.

TITLE: Production of four and five particles as a result of collisions at high energy

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1295-1306

TOPIC TAGS: particle production, high energy particle, particle interaction, inelastic scattering, asymptotic property

ABSTRACT: Asymptotic expressions previously derived (K. A. Martirosyan, preprint, ITEF, 1963) for "truly inelastic" processes are used for the determination of the most likely momentum configurations in reactions in which two particles are transformed into four or five particles at high energies. The earlier research was devoted to transformation of two into three particles. A general method of integrating over the momenta of the generated particles (particularly

Card 1/2

ACCESSION NR: AP4031151

over the transverse momentum components) and for determining the most important momentum configuration is obtained. The general form of the energy distribution of the particles is obtained, and it is shown that if 4 or 5 groups of such particles are produced, then these particles are emitted in the c.m.s. of the reaction inside a narrow cone about the initial direction, so that the total momenta of the particles within the different groups differ significantly in magnitude. The total cross sections of the reactions are obtained by taking into account the contribution of only one pole in the j-plane. Orig. art. has: 5 figures and 41 formulas.

ASSOCIATION: None

SUBMITTED: 03Sep63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: NP NR REF SOV: 004 OTHER: 001

Card 2/2

ACCESSION NR: AP4037583 S/0056/64/046/005/1700/1714

AUTHORS: Verdiyev, I. A.; Kancheli, O. V.; Matinyan, S. G.; Popova, A. M.; Ter-Martirosyan, K. A.

TITLE: Complex asymptotic expressions for inelastic processes amplitudes and singularities in the angular momentum plane

SOURCE: Zh.eksper. i teor. fiz., v. 46, no. 5, 1964, 1700-1714

TOPIC TAGS: asymptotic solution, inelastic scattering, Regge pole, moving pole method, high energy particle

ABSTRACT: A previously developed momentum integration technique for a small number of particles (ZhETF v. 46, 568 and 1295, 1964) is used to calculate the total cross sections for the production of n particles (or n groups of particles having a low particle energy in the c.m.s. of each group) and the energy distribution of the particles in high-energy inelastic collisions. The values previously obtained

ACCESSION NR: AP4037583

for the most important "genuinely inelastic" collisions, corresponding to the contribution of an isolated vacuum Regge pole, are used to determine the asymptotic amplitudes. It is assumed that all particles are identical and have no isospin. It is shown that for any inelastic process there is a definite particle momentum configuration making the most significant contribution to the amplitude. The distributions of these particles with respect to the logarithms of their momenta are determined and are found to depend on the behavior of the vertex functions. Unitarity in the s-channel for the zero-angle elastic-scattering amplitude is shown to be violated if these vertex functions do not decrease with decreasing squares of the reggeon momenta. The dependence of both halves of the s-channel unitarity condition for elastic scattering at nonzero angle on the momentum transfer is investigated, and it is shown that the right half of this condition does not represent the Regge asymptotic amplitude corresponding to the vacuum pole if the terms corresponding to the production of an arbitrary number of particles are taken into

Card 2/3

ACCESSION NR: AP4037583

account. The momentum-transfer dependence can be duplicated only if all asymptotic contribution from all the branch-point singularities on the right of the vacuum point, condensing toward the point j = 1, are taken into account. Orig. art. has: 48 formulas.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki (Institute of Theoretical and Experimental Physics); Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences, Georgian SSR); Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 03Sep63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: NP NR REF SOV: 004 OTHER: 003

Card 3/3

GRIBOV, V.N.; POMERANCHUK, I.Ya.; TER-MARTIROSYAN, K.A.

Moving branching points in the j-plane and Regge unitarity conditions. IAd. fiz. 2 no.2:361-391 Ag '65. (MIRA 18:8)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii i Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.

L 2745-66 EWT(1)

ACCESSION NR: AP5024352 UR/0367/65/002/002/0361/0391

44,55 44,55

AUTHOR: Gribov, V. N.; Pomeranchuk, I. Ya.; Ter-Martirosyan, K. A. 44,55 44 20

TITLE: Moving branch points in the j-plane and reggeon unitary conditions B

SOURCE: Yadernaya fiziki. v. 2, no. 2, 1965, 361-391

TOPIC TAGS: particle physics, reggeon, elastic scattering, scattering amplitude

ABSTRACT: Many-particle terms of unitarity conditions in the t-channel are analyzed as a basis for studying moving branch points in the j-plane. A hypothesis is proposed for extrapolating these terms to complex j. It is found that in this case branch points of the partial amplitude $f_j(t)$ appear in the j-plane which correspond to production thresholds for two or more reggeons with an orbital moment of relative motion equal to -1. For two spin-zero particles in an intermediate state, the partial wave has singular points at orbital moments with negative integral values. As has been previously noted, these singularities move to the right when the particles in the intermediate state have a non-zero spin. The branch points in the j-plane are caused by propagation of this shift through the entire Regge trajectory. Mandelstam pointed out this mechanism for generation of branch points using one class of Feynman diagrams as an example. The existence of branch points $j=j_n(t)$,

Card 1/3

L 2745-66
ACCESSION NR: AP5024352

3

where $j_n(t) = n\alpha(t/n^2) - n + 1$, considerably alters the analytic properties of $f(t)$ in the t-plane, producing branch points in this plane at $t = t_n(j)$, where $t_n(j)$ is the solution to the equation $j=j_n(t)$. The discontinuity $\delta_t(n)f_j(t)$ of amplitude $f_j(t)$ is calculated for the singular point $t= t_n(j)$ which corresponds to the production threshold for n reggeons (reggeon unitarity conditions). It is shown that this discontinuity has a form similar to that for the ordinary unitarity condition, being determined by the product of amplitudes $N_{j,n}$ for the production of n reggeons defined above and below the cross section in the t-plane from the point $t=t_n(j)$. The discontinuity $\delta_t(n)f_j(t)$ of amplitude $f_j(t)$ on the cross section associated with the branch point for $t=t_n(j)$ is calculated for $t \to t_n(j)$. It is shown that this discontinuity has the form $[t - t_n(j)]^{n-2} \sim [j - j_n(t)]^{n-2}$.
This means that the singularity $j= j_n(t)$ is logarithmic, i. e. close to this point

$$f_j(t) \simeq A_n + B_n [j - j_n(t)]^{n-2} \ln [j - j_n(t)],$$

where A_n and B_n have no singularities at $j=j_n(t)$. The results may be used for analyzing the asymptotic behavior of diffraction scattering amplitude in the vicinity of

21,44,55

Card 2/3

L 2745-66
ACCESSION NR: AP5024352

small values of the quantity $q^2 = -t$ for transmitted momentum. "The authors are grateful to Ya. Azimov for calling their attention to one of the problems discussed in the paper. In conclusion, we would like to express our sincere gratitude to I. Ya. Azimov, A. A. Ansel'm, G. S. Danilov, I. T. Dyatlov and Yu. A. Simonov for interesting discussions and several important comments on problems considered in this work." Orig. art. has: 20 figures, 80 formulas.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKIAE (Institute of Theoretical and Experimental Physics, GKIAE); Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences, SSSR)

SUBMITTED: 23Jan65 ENCL: 00 SUB CODE: NP, MA

NO REF SOV: 007 OTHER: 012

Card 3/3

ACC NR: AT6031152 SOURCE CODE: UR/3138/66/000/417/0001/0121

AUTHOR: Ter-Martirosyan, K.

ORG: none

TITLE: Interaction at high energies (experiment and theory of complex moments)

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 417, 1966. Vzaimodeystviye pri vysokoy energii; teoriya kompleksnykh momentov i eksperiment, 1-121

TOPIC TAGS: high energy interaction, exchange reaction, particle interaction, complex moment theory, Regge pole model, two particle nonelastic process, charge exchange reaction, resonance state reaction, small momentum transfer

ABSTRACT: Data obtained in an experiment on the interaction of particles at high energies, up to $E_{lab} \sim 30$ Bev, are analyzed on the basis of the theory of complex moments and its simplest form — a Regge pole model. It is shown that all available data are in good agreement with the theoretical. Particularly interesting results were obtained in investigating the simplest two-particle nonelastic processes, such as various charge-exchange reactions (of π, k mesons, nucleons), and

Card 1/3

L 05800-67

ACC NR: AT6031152

resonance-state reactions Δ, ρ, η, etc., at small momentum transfers πN, KN, pd, dispersed at angles close to 180°. Theoretically, some of these processes are more "elementary" than small-angle elastic scattering, since selection in the t (or u) channel allows only a much smaller number of states. This considerably simplifies theoretical analysis. An especially simple situation occurs in a case when the momentum transfer is small or equal to zero, and when the terms which depend on particle spin are not essential. Concerning these processes, the theory leads to a number of specific statements which may be verified experimentally and which are partially confirmed by data obtained by other authors. In particular, the experiment emphatically confirms the expected reduction in the angular distribution cone in the reactions $\pi^- p \to \pi^0 n$, $\pi^- p \to \eta^0 n$. Further investigation of these processes may lead to a direct confirmation or refutation of the entire theory. Satisfactory agreement with the theoretical may be obtained also by analyzing data on the small-angle scattering of various particles. However, in this case the theoretical formulas contain too many parameters, so that the results obtained do not lead to any definite conclusions. The main difficulty of the theory lies in the fact that its simplest form, the Regge pole model, is theoretically an open scheme. As was shown, each of the poles, generally speaking, is not small. The role of branching points is briefly discussed. It is pointed out that, in principle, there may be a solution which corresponds to a theoretical equation in which the

Card 2/3

L 05800-67

ACC NR: AT6031152

6

t—O branching is of no consequence. In this case, the whole picture including the theory and all the existing data would be closed and self-consistent. The author thanks V. N. Gribov, I. Ya. Pomeranchuk, A. B. Kaydalov, and V. Mel'nikov for a discussion of a number of problems in the present article, and A. L. Gol'dina and R. K. Martirosyan for their assistance in making some of the computations and in compiling the graphs. Orig. art. has: 6 tables and 63 figures. [Author's abstract]

SUB CODE: 20/ SUBM DATE: 19Jan66/ ORIG REF: 028/ OTH REF: 060/

Card 3/3 bld

TER-MARTIROSYAN, Z.G.; TSYTOVICH, N.A.

Secondary consolidation of clays. Osn., fund. i mekh. grun. 7 no.5:12-15 '65. (MIRA 18:10)

TER-MARTIROSYAN, Z.G.

Unstability of the stressed state of nondrained clayey soils. Izv.AN AR Arm.SSR.Ser.tekh.nauk 18 no.4:40-48 '65.
(MIRA 18:9)

1. Institut geologicheskikh nauk AN ArmSSR.

KUDINOV, V.M.; PUKHOV, A.P.; LISOGURSKIY, I.Z.; TERMER, V.Yu.

Experimental assembly for the automatic weighing of powdered components for rubber mixtures at the Yaroslav Tire Factory. Kauch.i rez. 19 no.3:45-49 Mr '60. (MIRA 13:6)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i Yaroslavskiy shinnyy zavod.
(Yaroslavl--Tires, Rubber) (Weighing machines)

POLYAK, M.A.; TERMER, V.Yu.; NAZAROVA, M.V.

"Information bulletin on the foreign chemical industry." Kauch. i rez. 22 no.5:61 My '63. (MIRA 16:7)
(Tires, Rubber)

TERMER, V.M.; DEMIDOV, G.K.

Improved vulcanizer for rim bands. Kauch. i rez. 24 no.7:47-48 Jl '65. (MIRA 18:8)

1. Yaroslavskiy shinnyy zavod.

PAFFENGOL'TS, Konstantin Nikolayevich; TER-MESROPYAN, Grigoriy Tatevosovich; MKRTCHYAN, S.S., otv. red.

[Aragats; geological outline of the Aragats volcanic massif] Aragats; geologicheskii ocherk Aragatskogo vulkanicheskogo massiva. Erevan, Izd-vo AN Arm.SSR, 1964. 78 p. (MIRA 17:6)

BARON, Lazar Izrailevich; VLASOV, Orest Yevgen'yevich; SMIRNOV, Sergey Anatol'yevich; TERMETCHIKOV, Marat Karimovich; LEDOVSKAYA, V.V., otv. red.; IVLEVA, N.P., red.; BERESLAVSKAYA, L.Sh., tekhn. red.; GALANOVA, V.V., tekhn. red.

[Effect of the shape of the blasting charge on the results of the explosion] Vliianie formy zariada vybrosa na rezul'tat vzryva. Moskva, TSentr.in-t tekhn.informatsii ugol'noi promyshl., 1959. 15 p. (MIRA 15:1)
(Blasting)

TERMETSHIKOV, M. K.

PHASE I BOOK EXPLOITATION SOV/3618

Akademiya nauk Kirgizskoy SSR

Izvestiya. Seriya yestestvennykh i tekhnicheskikh nauk, tom 1, vyp. 1 (News. Series on Natural and Technical Sciences, Vol 1, No. 1) Frunze, 1959. 164 p. 500 copies printed.

Ed.: F.T. Kashirin; Tech. Ed.: M.G. Anokhina.

PURPOSE: This book is intended for research scientists and teachers in institutes of higher education who may be interested in developments and research trends in various scientific fields.

COVERAGE: The book contains 12 articles by persons affiliated with the Academy of Sciences Kirgiz SSR on studies in physical chemistry, industrial chemistry, applied physics (blasting dynamics), electric power engineering, electronics, agronomy, metallurgy, pure mathematics, etc. A bibliography of 1957 publications of the Academy includes works on history, archeology, economics, linguistics, literature, geology, biological sciences (botany, zoology, medicine), and technology. No personalities are mentioned. References accompany most of the articles.

AVAILABLE: Library of Congress (Q 60.A516A2)

17

BARON, L.I., prof.doktor tekhn.nauk; LEVCHIK, S.P., gornyy inzh.; TERMETCHIKOV, M.K., gornyy inzh.

Investigating the shattering and propellant effect of explosives. Vzryv.delo no.44/1:158-166 '60. (MIRA 13:7)
(Explosives--Blast effect)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410020-6"

BARON, L.I.; TERMETCHIKOV, M.K.

Comparative rating of the explosive effect of various explosives.
Izv.AN Kir SSR.Ser.est.i tekh.nauk 2 no.2:55-64 '60.
(MIRA 14:10)

(Explosives--Testing)

IMARALIYEV, A.; TERMETCHIKOV, M.K.; AMANOV, A.; TASHIBAYEV, B.

Method of determining the detonation speed of mudcaps and borehole charges using a MPO-2 oscillograph with eight loops. Izv.AN Kir.SSR.Ser.est.i tekh.nauk 2 no.2:91-97 '60. (MIRA 14:10)

(Blasting) (Oscillograph)

TERMETCHIKOV, M.K., kand. tekhn. nauk

Use of explosions in the national economy; a conference of the Scientific Council. Vest. AN SSSR 33 no.10:115 O '63.
(MIRA 16:11)

TYULENEV, Ye.A., kand.tekhn.nauk; TER-MIKAELYAN, F.M., inzh.

Effect of clay mortars on the adhesion of concrete to reinforcements. Transp.stroi. 9 no.8:45-46 Ag '59. (MIRA 13:1)

(Omsk--Bridges--Foundations and piers)
(Reinforced concrete--Testing)

KHLEBNIKOV, Ye.L., prof. [deceased]; TER-MIKAELYAN, F.M., inzh.

Concrete piles with wider pedestals cast in bore holes. Trudy TSNIIS no.38:4-57 '60. (MIRA 13:11)
(Concrete piling)

TER-MIKAELYAN, F. M., inzh.; CHEZHIN, V. A., inzh.

Widening the base of shell piles in cohesive soils. Transp. stroi. 13 no.3:12-17 Mr '63. (MIRA 16:4)

(Bridges—Foundations and piers)

TER-MIKAYELYAN, K.L.

Some methods for the experimental determination of rock pressure. [Trudy] NIIOSP no.41:18-32 '59. (MIRA 15:2)
(Rock pressure)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410020-6"

TER-MIKAELYAN, M. L.

Nuclear Science Abstracts
July 15, 1954
Physics

SPECTRUM OF BREMSSTRAHLUNG EMISSION IN THE ATMOSPHERE. M. L. Ter-Mikaelyan. Dokiady Akad. Nauk S.S.S.R. 94, 1033-6(1954) Feb. 21. (In Russian).

It is shown that the Bethe-Heitler equation is applicable for the bremsstrahlung spectrum in cases where the frequency $\omega \gg \sqrt{\frac{4\pi Ne^2}{m}\frac{E}{mc^2}}$, but for cases where $\sqrt{\frac{4\pi Ne^2}{m}} < \omega < \sqrt{\frac{4\pi Ne^2}{m}\frac{E}{mc^2}}$, the formula describing the atmospheric bremsstrahlung spectrum is $dI = \frac{E_s^2 m}{12\pi^2 LN}\frac{\omega^2 d\omega}{E^2}$, where L is the length of the radiation unit in cm, E_s is 21 Mev, and N is the number of electrons per unit volume. (J.S.R.)

9-21-54
RmL

Translation 2524467, 30 Dec 54

TER-MIKAYELYAN, M.L.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410020-6"

TER-MIKAYELYAN, M.L.

Radiation and scattering of fast particles in matter. Izv.AN SSSR Ser.fiz.19 no.6:657-660 N-D '55. (MIRA 9:4)

1.Fizicheskiy institut Akademii nauk Arm.SSR.
(Cosmic rays) (Nuclear physics)

ROZENTAL', I.L.; TER-MIKAELYAN, M.L.; FEYNBERG, Ye.L.

On high-energy photon showers. Dokl. AN SSSR 103 no.4:581-584 Ag'55
(MIRA 8:11)

1. Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR. 2. Institut fiziki Akademii nauk Armenskoy SSR. Predstavleno akademikom D.V.Skobel'tsynym

(Photons)

Ter-Mikaelyan, M. L.

...parameter method

AUTHOR: Ter - Mikayelyan, M.L. SOV/22-11-4-3/11

TITLE: On Quantum - ~~Electrodysamics~~ in a Medium I (K kvantovoy elektrodinamike v srede I)

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR, Seriya fiziko-matematicheskikh nauk, 1958, Vol. 11, Nr 4, pp 13 --20 (USSR)

ABSTRACT: The paper is devoted to the investigation of the influence which the dielectric and magnetic properties of a medium effect on the radiation corrections. In the calculation of these corrections e.g. in the case of Coulomb dispersion there follow logarithmically divergent results. The coincidence with experimentally observed data is realized, as is well-known, by certain compensating set ups. But the results of Landau, Pomeranchuk and of the author show that these compensations (continuous radiation) depend on the properties of the medium so that the magnitude of the radiation corrections also depends on the medium. For the correct determination of the corrections one has to set up the dispersion matrix under regard of the medium. In the present paper the author gives a partial solution of this problem : He calculates the dispersion matrix

Card 1/2

On Quantum - Electrodynamics in a Medium I SOV/22-11-4-3/11

taking into consideration the polarization properties of the medium.
There are 6 references, 5 of which are Soviet, and 1 is American.

ASSOCIATION: Fizicheskiy institut A.N. Armyanskoy SSR (Physical Institute, A S Armenian SSR)

SUBMITTED: June 23, 1958

Card 2/2

SOV/56-35-5-37/56

24(5)

AUTHORS: Ter-Mikayelyan, M. L., Khachatryan, B. V.

TITLE: On the Limits of Applicability of Target Parameters (O granitsakh primenimosti metoda pritsel'nykh parametrov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 5, pp 1287-1289 (USSR)

ABSTRACT: When investigating radiation processes both the usual perturbation theory and the method of target parameters (pritsel'nyy parametr) are employed. H. Ueberall (Yuberall) (Ref 1) expressed the opinion that the method oftarget parameters furnishes results of insufficient accuracy. The authors of this paper compare the results obtained by this method. First, bremsstrahlung on an atom is investigated. For this purpose the bremsstrahlung cross section is written down according to Ueberall,and the corresponding cross section determined by the target parameter method is written down. The formula obtained by the method of target parameters agrees with the exact formula only in the range $q_{\perp}^2 \ll 1$. (The meaning of $q_{\perp}$ has apparently been defined in the aforementioned earlier paper by Ueberall). This corresponds to periods of time (pritsel'noye rasstoyaniye) which are greater

Card 1/3

than $\hbar/mc$. An analogous investigation is possible also for the formation of pairs. The authors then deal with the radiation and formation of pairs in periodic structures. The formulae applying in this case differ from the corresponding formulae for a single atom by a factor which takes the interference phenomena in radiation and formation of pairs in an atomic chain into account. The analogous formulae can also easily be determined by the method of target parameters. Also in this case a factor is added to the formulae for a single atom. The authors of this paper express the opinion that the formulae derived by the target parameter method are in full agreement with those derived by Ueberall. A similar investigation can also be carried out for collisions between charged particles and the electrons of the atomic shell (ionization losses). There are 3 references, 2 of which are Soviet.

ASSOCIATION: Yerevanskiy gosudarstvennyy universitet (Yerevan State University)

TER-MIKAYELIAN, M. L.

"On the Theory of Multiple Scattering." Nuclear Physics, Vol. 9, no.4, 1959, pp. 679-686. (No. Holland Publ. Co., Amsterdam)

Physical Inst, Acad. Sci. Armenian SSR, Yerevan.

A method for calculation of multiple scattering curves taking into account the finite dimensions of the nucleus is presented. Experimental results pertaining to scattering of fast electrons by nuclei are used in the calculations.

9

21(8),24(3)

AUTHOR: Ter-Mikayelyan, M.L. SOV/22-12-3-9/9

TITLE: The Radiation of a Relativistic Electron Moving on a Circle in the Plasma

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko - matematicheskikh nauk, 1959, Vol 12, Nr 3, pp 95-99 (USSR)

ABSTRACT: The author communicated the results of the present paper in 1953 in the seminar of the FIAN imeni P.N.Lebedev. Partially they are contained in the papers of V.L.Ginzburg (Doklady Akademii nauk SSSR, 1952, Vol 87) and Tsytovich (Vestnik MGU, 1951, Nr 11). The author has published the present paper at the request of G.Gurzadyan. He considers the radiation of a relativistic electron moving in the magnetic field under existence of plasma. Especially he treats the case of a plasma for which $\sqrt{\varepsilon} \approx 1 - \frac{2\pi N e^2}{m n^2 \omega_0^2}$. The intensity of radiation is given for several frequency ranges.
There is 1 Soviet reference.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Physics Institute, AS Armenian SSR)

SUBMITTED: March 7, 1959

Card 1/1

05696

9(3) SOV/22-12-4-9/9

AUTHOR: Ter-Mikayelyan, M.L.

TITLE: On the Theory of the Transition Radiation

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, 1959, Vol 12, Nr 4, pp 141-145 (USSR)

ABSTRACT: The author considers the radiation which arises under the transition of a particle from a medium with the dielectric constant ε_1 into a medium with the dielectric constant ε_2. Starting from the expressions for the electric fields already occurring in /~Ref 2_7 the author determines the angular and frequency distribution of the transition radiation. V.L.Ginzburg and V.P. Silin are mentioned in the paper. There are 2 Soviet references.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Physical Institute AS Armenian SSR)

SUBMITTED: April 24, 1959

Card 1/1

24(5)
SOV/56-36-1-35/62

AUTHOR: Ter-Mikayelyan, M. L.

TITLE: On the Theory of Multiple Scattering (K teorii mnogokratnogo rasseyaniya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 253-257 (USSR)

ABSTRACT: The present paper describes a method of calculating multiple scattering in consideration of the finite dimensions of the nucleus. First, the kinetic equation is written down which is satisfied by the distribution function in the case of small scattering angles. Further interest is caused by the distributin function for only one angle θ_x or θ_y. (These are the projections of the scattering angle θ on to 2 planes which are vertical to each other and which pass through the initial direction of motion). In a cloud chamber it is much easier to measure the projection of a scattering angle than to measure the spatial scattering angle itself. It is therefore necessary to integrate the solution of the aforementioned equation over an angle of the projections. The solution thus found then holds for any law of scattering at small scattering angles. The author at

Card 1/3

first deals with a pure Coulomb scattering on an immobile nucleus. Therefore $\sigma(\theta_x, \theta_y)$ is the Rutherford scattering cross section in consideration of the form factors of the atom and of the nucleus. The calculation is followed step by step. In this way the curves for the scattering in 4.5 g/cm^2 and 8.5 g/cm^2 lead plates at the velocities 0.61 c (momentum of the muon 80 Mev/c), 0.73 c (p = 110 Mev/c), 0.78 c (p = 130 Mev/c) and 0.85 c (p = 170 Mev/c) were calculated. From the diagrams thus obtained the mean values of scattering angles and the mean values of their squares were then determined by numerical integration. Some of these results are illustrated by a table. The method discussed is also suited for determining the mass from the scattering angle and from the range measured by means of a cloud chamber. The results obtained by the present paper do not depend to any considerable extent on the cutting-off parameter. According to the author's opinion, the theory of multiple scattering developed by M. Annis et al. (Ref 7) is, with respect to finite nuclear dimensions, only a bad approximation to reality. In conclusion, the author makes some remarks concerning the limits of ...

applicability of the formulas derived in the present paper. The author thanks F. I. Strizhevskiy for calculating several curves of multiple scattering, and he also expresses his gratitude to A. I. Alikhanyan, F. R. Arutyunyan, V. G. Kirillov-Ugryumov and M. I. Dayon for discussions which gave rise to this work. There are 1 table and 9 references, 2 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences, Armyanskaya SSR)

SUBMITTED: July 14, 1958

32423

S/056/60/038/03/21/033
B006/B014

24.6900

AUTHOR: Ter-Mikayelyan, M. L.

TITLE: Investigation of the Limit of Applicability of the Theory of Ionization Losses

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 3, pp. 895-905

TEXT: The author of the present paper investigates the limits of applicability of the theory of energy losses to excitation, ionization, and Cherenkov radiation at ultrahigh energies (for brevity, all these losses are hereinafter termed ionization losses). It is shown that the longitudinal distances increase with particle energy in ionization losses as well as in radiative losses during collisions with individual atoms. If the effective distances become sufficiently large, the particle trajectories can be disturbed by external causes, and the theory of ionization losses is influenced thereby. The author investigates three effects: multiple scattering, polarization of the medium, and finiteness of the trajectories. The effect of finiteness of the trajectories upon

Card 1/2

82420

Investigation of the Limit of Applicability of the Theory of Ionization Losses

S/056/60/033/03/21/033
B006/B014

the Cherenkov radiation was investigated by I. Ye. Tamm for the first time. Consideration of these effects in the theory of radiative losses (Refs. 2-4) leads to a considerable change in the formulas for bremsstrahlung and pair production. Consideration of the polarization of the medium in the computation of ionization losses leads to the well-known effects of Fermi density and Cherenkov radiation. The main chapters of the paper (Sections 2 and 3) deal with the influence exerted by elastic multipole scattering upon ionization losses. Energy losses of an arbitrarily moving particle are computed from Maxwell's macroscopic equations. Ionization losses are separated from radiative losses without making use of the perturbation theory. It is found that, because of the density effect, the influence of multiple Coulomb scattering on ionization losses is negligible. There are 7 references, 6 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences of the Armyanskaya SSR)

SUBMITTED: August 25, 1959

Card 2/2

83724

S/056/60/038/004/017/048
B006/B056

24.6600

AUTHOR: Ter-Mikayelyan, M. L.

TITLE: The Radiative Correction to Coulomb Scattering Taking Account of the Medium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 4, pp. 1167 - 1169

TEXT: Following an earlier paper (Ref. 1), the author investigates the conditions for the occurrence of an action of the medium upon Coulomb scattering, and discusses the radiative correction to electron scattering taking account of the "density effect". The action of the polarization of the medium upon elastic scattering is investigated where photons appear at the beginning and at the end of the process, so that the entire influence of the polarization of the medium is brought to bear upon the photon distribution function. In a medium a photon undergoes a series of absorptions and emissions, so that, for the purpose of determining the change in the distribution function, it is necessary to summate over a number of Feynman graphs, each of which differs from the

Card 1/3

83724

The Radiative Correction to Coulomb Scattering Taking Account of the Medium

S/056/60/038/004/017/048
B006/B056

preceding one by an additional absorption- and emission event. The author's considerations lead to the following result: Experimentally, always the sum of the two cross sections, viz. of the elastic Coulomb cross section and of the bremsstrahlung cross section is measured. The bremsstrahlung quanta have an energy that is lower than a certain gi- n energy of $h\omega_{min}$, which is determined by the resolution of the experimental arrangement. If $\omega_{min} < \sqrt{4\pi NZe^2/m}\, E/mc^2$, the corrections necessitated by the medium become considerable. In second perturbation-. retical approximation, the correction is given by

$$d\sigma = d\sigma_{vac}(\omega_{min}) - d\sigma_{coul}\frac{4\alpha}{\pi}\ln^2\frac{m^{3/2}c^2\omega_{min}}{E\sqrt{4\pi NZe^2}},$$

where $d\sigma_{vac}$ is the usual differential scattering cross section with radiative correction in the vacuum. This correction formula holds for the scattering angles $\theta > \sqrt{1 - v^2/c^2 + 4\pi NZe^2/m\omega^2}$. For the medium, $\varepsilon(\omega) = 1 - 4\pi NZe^2/m\omega^2$ holds. In this paper, Mandel'shtam, Tamm, K. M. Poliyevktov-Nikoladze, Ye. L. Feynberg, and M. I. Ryazanov are mentioned. There are 5 references:

Card 2/3

83724

The Radiative Correction to Coulomb Scattering Taking Account of the Medium

S/056/60/038/004/017/048
B006/B056

4 Soviet and 1 US.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Institute of Physics of the Academy of Sciences of the Armyanskaya SSR)

SUBMITTED: August 25, 1959

X

Card 3/3

9.9300
24.2500 (1143,1482)

S/056/60/039/006/036/063
B006/B063

AUTHORS: Ter-Mikayelyan, M. L., Gazazyan, A. D.

TITLE: Resonance Effects of Radiation in a Laminated Medium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1693 - 1698

TEXT: A previous paper (Ref.1) dealt with the radiation associated with the motion of a charged particle in any "periodic" medium and presented a formula for the resonance radiation in a medium made up of two plates of equal thickness. The case of a laminated medium has been studied by I. M. Frank, V. L. Ginzburg, N. A. Khizhnyak, Ya. B. Faynberg, and G. M. Garibyan. Since, from an experimental point of view, laminated media are particularly suitable for detecting resonance radiation, the authors derived and checked the most important formulas for the calculation of this effect. This has been done for layers of different thicknesses and for any Δ.($\Delta = (N_1 - N_2)/(N_1 + N_2)$; N_1 and N_2 are the electron densities in two successive media). The formulas obtained in Ref.1 are used in quasi-classical approximation. To be able to apply the quasi-classical theory to

Card 1/4

a laminated medium, the boundaries between the layers must be smooth. Though the quasi-classical approximation leads to incorrect results for reflected waves, it may be used here since the effects related to reflection are negligible if the dielectric constants of the media of the two adjoining layers differ only slightly, i.e., if $|(\varepsilon_2-\varepsilon_1)/(\varepsilon_2+\varepsilon_1)| \ll 1$. This condition is satisfied within the range of high frequencies. In addition, it must be assumed that for $v \approx c$, the angles of radiation emission are small. This condition is satisfied if $\lambda \ll 1$, with $\lambda = \omega\sqrt{\varepsilon}/c$; l is the period of the medium. Using the results obtained in Ref.1, a formula is derived for the emission of a relativistic particle during the penetration of n layers:

$$S = \frac{d\omega}{\omega}\frac{e^2 n}{l}(\varepsilon_2-\varepsilon_1)^2 \sum_{r=1}^{r_{max}} \sin^2 \frac{\omega\Delta t_2}{2}\left(\frac{2\pi r v}{l\omega} - \frac{2\pi e^2}{m\omega^3}\frac{\Delta t_1}{\Delta t}(N_1-N_2)\right) \times$$
$$\times\left[\frac{2\pi}{l} r \frac{v}{\omega} - \left(1-\frac{v}{c}\right) - \frac{2\pi e^2}{m\omega^4}\left(N_1\frac{\Delta t_1}{\Delta t} + N_2\frac{\Delta t_2}{\Delta t}\right)\right] \times \tag{14}$$
$$\times\left[\frac{2\pi}{l} r \frac{v}{\omega} - \frac{2\pi e^2}{m\omega^3}\frac{\Delta t_1}{\Delta t}(N_1-N_2)\right]^{-2}\left[\frac{2\pi}{l} r \frac{v}{\omega} - \frac{2\pi e^2}{m\omega^3}\frac{\Delta t_2}{\Delta t}(N_2-N_1)\right]^{-2}.$$

88444

Resonance Effects of Radiation in a Laminated Medium S/056/60/039/006/036/063 B006/B063

r is an integer by which the harmonics are numbered; $r \geqslant 1$; $v\Delta t = v(\Delta t_1 + \Delta t_2) = l$ is the total thickness of two successive media; t_i is the time of flight in the i-th layer. The emitted frequencies lie between $\omega_{min} = l\pi e^2(N_1 + N_2)/2\pi r v m$ and $\omega_{max} = 4\pi r v(E/mc^2)^2/l$. For the number of quanta emitted one obtains the following relation if $\Delta \ll 1$:

$M = \sum_{r=1,3,5}\left(\frac{N_1-N_2}{N_1+N_2}\right)^2 \frac{1}{137 l r}\frac{8}{3\pi}$; if Δ is not much smaller than 1, then

$$M = \frac{4}{137}\frac{1}{l\pi}(q+p)^2\sum_r \frac{1}{r}\int \frac{dy\,[y-(b/a^2)(1-v/c)-y^2]}{(1-py)^2(1+qy)^2} \times$$

$$\times \sin^2\left[\frac{q}{p+q}\pi r - y\pi r\frac{pq}{p+q}\right], \qquad (32)$$

$$p = \Delta t_1(N_1 - N_2)/(N_1\Delta t_1 + N_2\Delta t_2), \qquad q = p\Delta t_2/\Delta t_1.$$

holds for the case of layers with different thicknesses; $y = b\xi/a^2$;

Card 3/4

88444

Resonance Effects of Radiation in a Laminated Medium

S/056/60/039/006/036/063
B006/B063

$a = 2\pi rv/l$; $b = \frac{2\pi e^2}{m}\left(N_1 \frac{\Delta t_1}{\Delta t} + N_2 \frac{\Delta t_2}{\Delta t}\right)$; $a/\omega = 2\pi vr/\omega l = \xi$. There are 3 Soviet references.

ASSOCIATION: Yerevanskiy gosudarstvennyy universitet (Yerevan State University). Fizicheskiy institut Akademii nauk Armyanskoy SSR (Institute of Physics, Academy of Sciences Armyanskaya SSR)

SUBMITTED: June 10, 1960

Card 4/4

BR

ACCESSION NR: AP4033063 S/0252/64/038/002/0105/0110

AUTHOR: Ter-Mikayelyan, M. L. (Corresponding member, AN Armyanskoy SSR)

TITLE: Calculation of pulsed laser intensity

SOURCE: AN ArmSSR. Doklady*, v. 38, no. 2, 1964, 105-110

TOPIC TAGS: pulsed laser, triggering radiation, energy quantum, absorption coefficient, population rate, laser burst

ABSTRACT: Intensity estimates have been made on pulsed lasers with triggering radiation intensity at $t = 0$, of Σ_0. The intensity is defined as the number of quanta crossing an area 1 cm^2 in one second at time t. Rate of change of energy quanta intensity is given by

$$\frac{\partial \Sigma}{\partial t} = v\Sigma(x_1 - x),$$

$$x = x_0 + \frac{1-r}{2L};$$

Card 1/3

ACCESSION NR: AP4033063

where L - specimen length, v - speed of light in specimen, χ_0 - absorption coefficient (not including resonance), χ_1 =

$$\chi_1 = \Delta(x, t)\,\sigma$$

σ = cross section, r = reflection coefficient (reflectivity). From χ_1 follows the second unknown function of time, the population inversion, for which a second equation is introduced. This equation balances the decrease of excited atoms caused by induced radiation with the intensity gain induced by emitted quanta. The resulting differential equation

$$\frac{\partial^2 \ln \Delta}{\partial t^2} = v\sigma_{21}\frac{\partial \Delta}{\partial t} - \varkappa v \frac{\partial \ln \Delta}{\partial t},$$

is integrated over t, for initial condition t = 0; $\Sigma = \Sigma_0$, $\Delta = \Delta_0$ yielding

$$\Sigma(t) = \frac{\frac{v\Delta_0}{2} + \Sigma_0}{\frac{v\Delta_0}{2\Sigma_0}\exp\{-\sigma_{21}(v\Delta_0 + 2\Sigma_0)t\} + 1},$$

Card 2/3

ACCESSION NR: AP4033063

where, if one neglects Σ_0 compared to $v\Delta_0$ one gets the exponential expression

$$\Sigma(t) \sim \exp(-v\varkappa t).$$

For this case the effective time characteristic of the laser burst is of the order given by the larger of the two magnitudes

$$\delta\tau \sim \frac{1}{\sigma v \Delta_0} \ln \frac{v\Delta_0}{2\Sigma_0} \text{ and } \delta\tau \sim \frac{L}{(1-r)v_e}$$

Orig. art. has: 17 formulas.

ASSOCIATION: none

SUBMITTED: 00 ATD PRESS: 3073 ENCL: 00

SUB CODE: EC NO REF SOV: 002 OTHER: 003

Card 3/3

ACCESSION NR: AP4034032 S/0020/64/155/006/1298/1301

AUTHOR: Ter-Mikayelyan, M. L.; Mikaelyan, A. L.

TITLE: Theory of Laser Emission

SOURCE: AN SSSR. Doklady*, v. 155, no. 6, 1964, 1298-1301

TOPIC TAGS: laser, stimulated light emission, radiation transfer, continuous laser, pulse laser, solid state laser

ABSTRACT: The authors use the transfer equations for generation of light in lasers with a solid rod having parallel mirrored ends. In these equations, they separate the absorption coefficient into two parts: one connected with stimulated emission, the other with the rest of the processes. The first part is proportional to the overpopulation, i.e., to the excess of the number of atoms in the upper state over that of the lower, per unit volume. The equations are solved for both the stationary case (continuous laser) and the discontinuous case (pulse operation). For the case of a negligibly small reflection coefficient, the solution gives the passage of photons through an overpopulated medium. Orig. art. has: 15 formulas.

ACCESSION NR: AP4034032

ASSOCIATION: Yerevanskiy gosudarstvenny*y universitet (Yerevan State University)

SUBMITTED: 08Oct63 ATD PRESS: 3076 ENCL: 00

SUB CODE: EC NO REF SOV: 006 OTHER: 003

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410020-6"

TER-MIKAYELYAN, M.L.

Emission of fast particles in a heterogeneous medium. Dokl.AN SSSR 134 no.2:318-321 S '60. (MIRA 13:9)

1. Fizicheskiy institut Akademii nauk Armyanskoy SSR. Predstavleno akad. L.D.Landau.

(Dynamics of a particle)

TER-MIKAYELYAN, M. L.

Doc Phys-Math Sci - (diss) "Effect of media on electromagnetic processes at high energies." Moscow, 1961. 9 pp; (Academy of Sciences USSR, Physics Inst imeni P. N. Lebedev); 200 copies; price not given; (KL, 5-61 sup, 171)

21989
S/022/61/014/002/007/008
B125/B205

24.4500

AUTHOR: Ter-Mikayelyan, M. L.

TITLE: Emission of photons by fast particles in an inhomogeneous medium

PERIODICAL: Izvestiya A'.ademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, v. 14, no. 2, 1961, 103-133

TEXT: The first six sections of the present paper were simultaneously published in the periodical "Nuclear Physics." The author was concerned with the radiation produced by charged particles passing through an inhomogeneous medium at constant velocity. The first six sections receive only a cursory treatment. The simplest example of radiation in an inhomogeneous medium is the so-called transition radiation of Ginzburg and Frank. The inhomogeneity of the medium is either a periodic or an arbitrary function of space. Sections 2-6 deal with the condition of resonance, angular distribution, and the energy threshold of resonance radiation; quasi-classical investigation; radiation in a medium, the properties of which vary according to the cosine law; a laminated medium

X

Card 1/10

21989

S/022/61/014/002/007/008
B125/B205

Emission of photons by fast ...

and the simultaneous processes: a) "thermal background;" b) effect of multiple scattering, photoeffect, and other factors. A. Ts. Amatuni and N. A. Korkhmazyan (Izv. AN ArmSSR, seriya fiz.-mat. nauk, 13, № 5, 1960), have derived a formula for radiation of the order of $r = 0; \pm 1$, assuming that $B \ll 1$ and $\Delta \ll \varepsilon_0$ but not that $\lambda \ll 1$. B. Bolotovskiy pointed out that the formulas derived have the same form as in the case of the effect studied by V. L. Ginzburg and V. Ya. Eydman (ZhETF, 35, 1509, 1958). Section 7 deals with the calculation of the passage of particles of any velocity through a medium having unevenly distributed inhomogeneities. The phenomena discussed here are very similar to those observed in the diffusion of light in turbid media. When determining the total number of emitted quanta in an inhomogeneous medium, it is necessary to calculate the number of equivalent pseudophotons corresponding to the field of the particle, which pass through an area of 1 cm^2 in a given frequency range at a given point during the whole time of flight of the particle. These pseudophotons are then scattered according to the well-known laws of light scatter by the inhomogeneities of the medium. This is illustrated best by the behavior of radiation on

Card 2/10

21989

Emission of photons by fast ... S/022/61/014/002/007/008
B125/B205

fluctuations in a gas, which corresponds to the Rayleigh light scatter. When determining the flux of pseudoneutrons, one proceeds from Maxwell's equations ($\mu = 1$) for the potentials on uniform motion of the particle along the z-axis:

$$\Delta\vec{A} - \frac{\varepsilon}{c^2}\frac{\partial^2\vec{A}}{\partial t^2} = -\frac{4\pi e\vec{v}}{c}\delta(z - vt),$$
$$\Delta\varphi - \frac{\varepsilon}{c^2}\frac{\partial^2\varphi}{\partial t^2} = -\frac{4\pi}{\varepsilon}e\delta(z - vt),$$
$$\frac{\varepsilon}{c}\frac{d\varphi}{\partial t} + \operatorname{div} A = 0. \quad (7.1)$$

(7.1).

Expansion in triple Fourier integrals with respect to the variables x, y, and z offers a solution in the form

$$\vec{E}(r, t) = \frac{i}{8\pi^3}\iiint dk_x dk_y dk_z \frac{4\pi e\left(\frac{\omega\varepsilon}{c^2}\vec{v} - \vec{k}\right)\exp\left(i\vec{k}\vec{r} - i\omega t\right)}{\varepsilon\left[k^2 - \frac{\varepsilon}{c^2}(\vec{k}\,\vec{v})^2\right]}. \quad (7.2)$$

Card 3/10

21989

S/022/61/014/002/007/008
B125/B205

Emission of photons by fast ...

$$m = \frac{1}{137} \frac{c^2}{v^2 \varepsilon^{1/2} \pi} \frac{d\omega}{\omega} \left[\ln \frac{k^2_{\varepsilon\,max}}{\left|1 - \varepsilon \frac{v^2}{c^2}\right| \frac{\omega^2}{v^2}} - \frac{v^2}{c^2} \varepsilon \right] h(\omega). \qquad (7.7)$$

This formula yields a solution to the problem in an isotropic medium for any inhomogeneities which are described by the extinction coefficient of electromagnetic waves. In the case of very hard quanta, it is possible to apply macroscopic electrodynamics. In the case of random distribution of the inhomogeneities, relativistic particles will excite a radiation, the wavelength of which is extremely small as compared to the dimensions of the inhomogeneities. (7.7) may be used to calculate the total number of emitted photons, the wavelength of which is larger than the inter-atomic distances. An experimental study of radiation in substances with great fluctuations is obviously most interesting. Emission of quanta of any frequency. For a detailed calculation of the emission of such quanta, the author applied the usual theory of light scatter. In this case, the incoming electromagnetic wave is replaced by the superposition

Card 5/10

of the electromagnetic waves producing the field of the moved particle. The equation for the fluctuation fields has the form

$$\begin{aligned} \operatorname{rot} E'_\omega &= \frac{i\omega}{c} H'_\omega, \\ \operatorname{rot} H'_\omega &= -\frac{i\omega}{c} D'_\omega, \\ \operatorname{div} D'_\omega &= 0, \\ \operatorname{div} H'_\omega &= 0. \end{aligned} \qquad (7.10) \qquad (7.10),$$

$$\Delta D'_\omega + \frac{\omega^2}{c^2} \varepsilon D'_\omega = -\operatorname{rot}\cdot\operatorname{rot}(\varepsilon' E_{\omega 0}). \qquad (7.11)$$

(7.11),

and the solution reads

$$D'_\omega(r) = -\frac{1}{4\pi}\left\{k'\left[k'\int\frac{E_{\omega 0}(r_1)}{|r-r_1|}\varepsilon'(r_1)\, e^{i\vec{k}(\vec{r}-\vec{r_1})}\, dv_{r_1}\right]\right\}. \qquad (7.12) \qquad (7.12).$$

21989

S/022/61/014/002/007/008
B125/B205

Also S. P. Kapitsa has applied a similar method. Next, the author studies fluctuations in which the correlation length is of the order of magnitude of the interatomic distances. Then, the mean square of the fluctuation field is given by

$$\overline{|E_{\omega}'^{2}|} = \frac{\overline{D_{\omega}'^{2}}}{\varepsilon^{2}} = \frac{1}{16\pi^{2}R^{2}\varepsilon^{2}} \int \left\{ \left[\vec{k}' \left[\vec{k}' \cdot \vec{E}_{\omega}(x_1, y_1) \right] \right] \right\}^{2} dv_{r_1} \times$$

$$\times \int e^{i\vec{k}'(\vec{r}_1 - \vec{r}_2) - i\frac{\omega}{v}(z_1 - z_2)} \overline{\varepsilon'(r_1)\varepsilon'(r_2)}\, dv_{r_2}. \qquad (7.15)$$

(7.15).

The exponent of the last integral in this expression is negligible for $\frac{\omega}{v}\left|1 - \frac{v}{c}\sqrt{\varepsilon}\cos\theta\right| l \ll 1$ (7.16), $l\frac{\omega}{c}\sqrt{\varepsilon}\sin\theta \ll 1$ (7.17). If (7.16) and (7.17) are not valid, (7.15) will become small and the radiation will vanish. (7.16) and (7.17) are always valid if the wave-length of the emitted wave is larger than the interatomic distances. For the number of quanta emitted per unit length one obtains

Card 7/10

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410020-6"

21989
S/022/61/014/002/007/008
B125/B205

Emission of photons by fast ...

$$m = \frac{I}{\hbar\omega \cdot Z} = \frac{1}{137} \frac{c^2}{v^2 \varepsilon^{3/2} \pi} \frac{d\omega}{\omega} \left\{ \ln \frac{k_{\rho\,max}^2 v^2}{|1 - \varepsilon_0 v^2/c^2|\, \omega^2} - \frac{v^2}{c^2}\varepsilon \right\} h(\omega), \quad (7.22) \qquad (7.22)$$

with

$$h(\omega) = \frac{\omega^4}{c^4 \cdot 6\pi} \int \overline{\varepsilon'(r_1)\, \varepsilon'(r_2)\, dv_{r_1 - r_2}} \quad (7.23) \qquad (7.23).$$

If the frequencies of the emitted radiation exceed the atomic frequencies, then

$$m \sim \frac{4 r_0^2 Z^2 N}{137} \frac{d\omega}{\omega^3} \frac{c^2}{l^2} \left\{ \ln \frac{k_{\rho\,max}^2 \cdot c^2}{\omega^2 |1 - v^2 \varepsilon(\omega)|} - 1 \right\}. \quad (7.25) \qquad (7.25)$$

will hold. Here, Z denotes the nuclear charge number of the material, N is the number of atoms per cm^3, and $r_o = e^2/m_e c^2$. There are 9 figures, 1 table, and 14 Soviet-bloc references.

Card 8/10

21989

S/022/61/014/002/007/008
B125/B205

Emission of photons by fast ...

ASSOCIATION: Institut fiziki AN Armyanskoy SSR (Institute of Physics, AS of the Armyanskaya SSR)

SUBMITTED: October 27, 1960

X

Card 9/10

30395
S/022/61/014/004/009/010
D299/D302

24.6700

AUTHOR: SekhposYan, E. V., and Ter-Mikayelyan, M. L.

TITLE: Angular distribution and polarization of bremsstrahlung

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, v. 14, no.4, 1961, 143-154

TEXT: The angular distribution, pair creation in the crystal, and the polarization of bremsstrahlung are investigated by the method of Weizsäcker-Williams. Calculation of the bremsstrahlung cross-section reduces to multiplying the Kleyn-Nishina formula by the total number of pseudophotons and to passing to a system of coordinates, in which the crystal is at rest. Angular distribution of quanta: The differential cross-section for bremsstrahlung in the crystal can be expressed by

Card 1/8

$$d\sigma = \frac{4r_0^2 Z^2}{137\pi} \frac{d\varepsilon}{\varepsilon} x dx \left[\frac{\varepsilon_1^2 + \varepsilon_2^2}{(1+x^2)\varepsilon_1^2} - \frac{4x^2 \varepsilon_2}{\varepsilon_1^2 (1+x^2)^4} \right] \times$$

$$\times \int \frac{(k_2^2 + k_3^2)\, dk_2 dk_3}{(k^2 + 1/R^2)^2} \left| \sum_i e^{i \vec{k} \vec{r}_i} \right|^2 \qquad (1.2)$$

where $R = R_0 Z^{-1/3}$, R_0 is the Bohr radius, r_0 - the classical electron-radius, $\vec{r}_i$ - the lattice coordinates, k - the momenta imparted to the nuclei, ε - the energy of the emitted quantum, ε_1 - the energy of the incident electron, ε_2 - the energy of the secondary electron. The last factor on Eq. (1.2) can be approximated by

Angular distribution and ... 30395
S/022/61/014/004/009/010
D299/D302

$$\left|\sum_i e^{i\vec{k}\vec{r}_i}\right|^2 = \left(1 - e^{-k^2\overline{u^2}}\right) N + e^{-k^2\overline{u^2}}\left|\sum_i e^{i\vec{k}\vec{r}_{io}}\right|^2 \qquad (1.3)$$

where $\bar{u}^2$ is the mean square of the thermal fluctuations of the lattice atoms, N - the number of atoms per unit volume. Depending on the number of terms in (1.3), the cross-section for bremsstrahlung and pair creation will consist of 3 components: $d\sigma = d\sigma_1 + d\sigma_2 + d\sigma_u$, where $d\sigma_1$ corresponds to the cross-section when the crystalline structure is ignored (the Bethe-Heitler formula), $d\sigma_2$ is a correction term due to thermal fluctuations, and $d\sigma_u$ is the interference cross-section which is largely dependent on the angle θ of the incident electron. The latter term is expressed by

Card 3/8

X

$$d\sigma_u = \frac{4r_0^2Z^2}{137\pi}\frac{d\varepsilon}{\varepsilon}x\,dx\left|\frac{\varepsilon_1^2+\varepsilon_2^2}{\varepsilon_1^2(1+x^2)^2} - \frac{4x^2\varepsilon_2}{\varepsilon_1(1+x^2)^4}\right| \times$$

$$\times \int \frac{(k_2^2+k_3^2)e^{-k^2\bar{u}^2}dk_2dk_3}{(k^2+1/R^2)^2}N\frac{8\pi^3}{bfd}\sum_{lmn}{}' \delta\left(k_x - \frac{2\pi}{b}l\right)\times$$

$$\times \delta\left(k_y - \frac{2\pi}{f}m\right)\delta\left(k_z - \frac{2\pi}{d}n\right). \quad (1.5)$$

After transformations, a simpler formula is obtained, and the integral it contains is calculated. Other formulas are obtained for $d\sigma_1$ and $d\sigma_2$. Comparing the three formulas for the components of $d\sigma$, the conclusion is reached that with sufficiently small angles θ, the main contribution to the bremsstrahlung is made by the interference term. with angles $\theta < \sqrt{u^2}\chi\delta(1 + x^2)$, the interference radiation is exponentially small. With $\bar{u}^2 \to \infty$, only the amorphous term

$d\sigma_1$ is retained. Pair creation: As the matrix element for pair creation coincides with the matrix element for bremsstrahlung, the derivation of the pertinent formulas reduces to changing the density of the finite states, i.e multiplication by $\frac{\mathcal{E}_-^2 d\mathcal{E}}{\mathcal{E}^2 d\mathcal{E}}$ and redefinition of variables: $\mathcal{E}_1 \to \mathcal{E}_-$, and $\mathcal{E}_2 \to \mathcal{E}_+$ ($\mathcal{E}_-$ is the energy of the electron, and $\mathcal{E}_+$ - of the positron). The conclusions of the foregoing section apply to pair creation as well. Polarization: After taking the average with respect to the polarization of the incident pseudophoton, one obtains

$$d\varphi = \frac{1}{4} r_o^2 d\Omega \frac{\nu'^2}{\nu^2}\left[\frac{\nu}{\nu'} + \frac{\nu'}{\nu} - 2\cos^2\xi \sin^2\theta\right] \qquad (3.2)$$

where θ is the scattering angle, ξ is the angle between the plane of polarization of the scattered pseudophoton and the plane $(\vec{n}'\vec{n})$, $\vec{n}$

- is the direction of the incident pseudophoton and $\vec{n}'$ - of the scattered one. Calculation of the cross-section reduces to multiplying formula (3,2) by the corresponding formula for the number of quanta and passing to a system, in which the nucleus (or crystal) is at rest. The final formulas for a single atom are

$$d\sigma = 4xdx\,\frac{Z^2 r_o^2}{137}\,\frac{d\varepsilon}{\varepsilon}\left[\frac{1}{2}\,\frac{\varepsilon_1^2+\varepsilon_2^2}{\varepsilon_1^2(1+x^2)^2}\right]\int\frac{k_\perp^2\,dk_\perp^2}{\left(k_\perp^2+k_{11}^2+\frac{1}{R^2}\right)^2} \qquad (3.3)$$

$$d\sigma_{11} = 4xdx\,\frac{Z^2 r_o^2}{137}\,\frac{d\varepsilon}{\varepsilon}\left[\frac{1}{2}\,\frac{\varepsilon_1^2+\varepsilon_2^2}{\varepsilon_1^2(1+x^2)^2}-\frac{4x^2\varepsilon_2}{\varepsilon_1(1+x^2)^4}\right]\int\frac{k_\perp^2\,dk_\perp}{\left(k_\perp^2+k_{11}^2+\frac{1}{R^2}\right)^2} \qquad (3.4)$$

30395

Angular distribution and ... S/022/61/014/004/009/010
D299/D302

where $d\sigma_{\perp}$ corresponds to $\xi = 90^{\circ}$, and $d\sigma_{11}$ - to $\xi = 0^{\circ}$. A comparison of the above results with formulas of the perturbation theory shows that the Weizsäcker-Williams method leads to accurate results for angles Θ, for which the main contribution to the bremsstrahlung is made by the interference term. With angles Θ, for which the amorphous term is significant too, the above method leads to a large error in the polarization, whereas the error in calculating the total cross-section is logarithmical only. There are 1 figure and 5 references: 1 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: I. I. Schiff, Energy-angle distribution of thin target-bremsstrahlung. Phys. Rev., 83, 252, 1951; H. Ueberall, Polarization of bremsstrahlung from monocrystalline targets, Phys. Rev., 107, 223, 1956; Michael M. May, On the polarization of high energy bremsstrahlung and of high energy Pairs, Phys. Rev., 84, 265, 1951; M. May and G. C. Wick, On the production of polarized high energy X-rays, Phys. Rev., 81, 628, 1951.

Card 7/8

X

30395

Angular distribution and ...

S/022/61/014/004/009/010
D299/D302

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Institute of Physics AS Armenian SSR)

SUBMITTED: December 29, 1960

Card 8/8

X

31798
S/056/61/041/006/050/054
B109/B102

24.6800

AUTHORS: Alikhanyan, A. I., Arutyunyan, F. R., Ispiryan, K. A., Ter-Mikayelyan, M. L.

TITLE: A way of detecting high-energy charged particles

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 2002-2010

TEXT: The case is considered where a fast charged particle passes through a layer consisting of two different substances of thicknesses l_1 and l_2 and of electron densities N_1 and N_2, where $N_1 > N_2$. Then, the exciting particle can be detected by way of the resulting photon emission.

$$dm = \frac{4p^2(1+\alpha)}{137\pi l_1} \sum_{r=1}^{r_{max}} \frac{d\omega}{r^3\omega^3} \frac{\left[1 - \frac{1}{4}(E_{1n}/E)^2 \omega/r - \omega^{-2}\right]}{(1 - p/\omega r)^2 (1 + p\alpha/\omega r)^2} \times$$
$$\times \sin^2\left[\left(\frac{\alpha}{1+\alpha}\right)\pi r - \frac{\pi}{\omega}\left(\frac{\alpha p}{1+\alpha}\right)\right]. \qquad (1.3)$$

Card 1/3

31798
S/056/61/041/006/050/054
B109/B102

A way of detecting high-energy...

is obtained according to M. L. Ter-Mikayelyan (DAN SSSR, 134, 318, 1960; Izv. AN ArmSSR, 14, 103, 1961) for the number of photons emitted in the frequency interval dω per cm of layer thickness. The frequency is measured in terms of $\omega_{1min} = l_1 r_e c(N_1+\alpha N_2)$. r_e is the classical electron radius, c - light velocity, $\alpha = l_2/l_1$, $p = (N_1 - N_2)/(N_1 + \alpha N_2)$,

$$E_{1\pi} = mc^2 l_1 [\pi^{-1} r_e (1+\alpha)(N_1+\alpha N_2)]^{1/2} \quad (1.6), \quad r_{max} \approx l_1 [\pi^{-1} r_e (1+\alpha)(N_1+\alpha N_2)]^{1/2} \quad (1.7).$$

The photon spectrum is between ω_{min} and ω_{max}, where

$$\omega^{(r)}_{\substack{min\\max}} = \left(r \mp \sqrt{r^2 - (E_{1p}/E)^2}\right)/(E^2_{1p}/2E^2). \quad (1.8)$$

and is shown in Fig. 1 for the case of $E = 2.2\ E_{1\pi}$, $\alpha = 1$. Fig. 2 shows the total number of quanta (ml_1) as dependent on the particle energy for $\alpha = 1$ and for different ω. For ω, values between 1.2 and 1.6 are shown to be the most convenient as regards the attainable number of quanta. The energy

Card 2/3

31798

A way of detecting high-energy... S/056/61/041/006/050/054
B109/B102

of the exciting particles can be inferred from the energy of emitted quanta. The particle energy range of $2\cdot 10^2 \leq E/mc^2 \leq 5\cdot 10^3$ is covered by using proportional or scintillation counters (determined lines of a gaseous absorber are excited. The factors (bremsstrahlung effects) affecting the noise level, and problems of recording of cosmic radiation are discussed. There are 4 figures, 3 tables, and 7 references: 5 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: J. A. Northrop, R. Nobles. Nucleonics, 14, 36, 1956; F. Reines, C. H. Cowan. Phys. Today, 10, 12, 1957.

ASSOCIATION: Institut fiziki Akademii nauk Armyanskoy SSR (Institute of Physics of the Academy of Sciences Armyanskaya SSR)

SUBMITTED: July 25, 1961

Card 3/3

30965
S/048/62/026/006/011/020
B125/B102

9.6150

AUTHORS: Alikhanyan, A. I., Arutyunyan, F. R., Ispiryan, K. A., and Ter-Mikayelyan, M. L.

TITLE: The possibility of detecting charged particles of high energies

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 6, 1962, 746-753

TEXT: The question is discussed whether resonance radiation resulting from fast particle passage through periodically (period l) alternating plates of thickness l_1 and l_2 ($l=l_1+l_2$, $\alpha=l_2/l_1$) can be used to detect fast particles and to measure their energy. The main contribution to the processes under consideration is that of the harmonics lying below a certain threshold. If the particle energy is much higher than threshold energy, the emitted frequencies ω of all harmonics lie somewhere between a maximum and a minimum, i.e. between $1/r$ and $4rE^2/E_n^2$; r is the order

Card 1/3

S/048/62/026/006/011/020
B125/B102

The possibility of detecting ...

of the harmonics. At energies which are not too high, but already relativistic, the particle radiates only on harmonics of large r. Radiations with new harmonics arise when the particle energy increases gradually. The energy loss due to resonance radiation depends only slightly on the thickness of the plates and decreases slowly with increasing α. The rapid decrease of the number of quanta beyond the maximum (for any harmonic) at $\omega \approx 1.5\ \omega_{min}$ makes it permissible to neglect the contribution of high frequencies to radiation intensity. The particle energy in the range $E/mc^2 = 2\cdot 10^2 - 2\cdot 10^3$ can be measured by the method of energy release. The method of characteristic radiation, applicable in the range $E/mc^2 = 5\cdot 10^2 - 5\cdot 10^3$, depends on the radiation in the layered medium being passed through an absorbing gas which thereupon emits radiation which is characteristic. Using the method of Compton scattering, which is suitable for a wide energy interval, the particle produced in the layer medium undergoes simple Compton scattering. The γ-quanta striking the lateral faces of the layer medium are recorded by liquid scintillators. The occurrence of resonance radiation is

Card 2/3

The possibility of detecting ... S/048/62/026/006/011/020
B125/B102

accompanied by background radiation. Cosmic muons of $\sim 10^{11}$ ev can be detected with a coincidence circuit. Muons of $\sim 5 \cdot 10^{11}$ ev and above can be detected by the method of characteristic radiation. Adequate experiments are in preparation. There are 4 figures and 2 tables.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute AS ArSSR)

4

Card 3/3

L 17974-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3000085

S/0022/63/016/002/0069/0078

AUTHORS: Gazazyan, A. D.; Sekhposyan, E. V.; Ter-Mikayelyan, M. L. 54 53

TITLE: Bremsstrahlung of soft quanta in second Born approximation

SOURCE: AN ArmSSR. Izv. Seriya fiziko-matem. nauk, v. 16, no. 2, 1963, 69-78

TOPIC TAGS: differential cross section, dielectric, polarization

ABSTRACT: Unlike the mathematical difficulties encountered in the general bremsstrahlung radiation problem given by P. Urban (Bremsstrahlung in 2 Bornscher Naherung, Acta phys. Austriaca, 13, No. 4, 1960) the author discusses the simpler solution which is restricted to the case of radiation in soft quanta. Expressions are obtained for the bremsstrahlung differential radiation cross section, given by the second Born approximation. The analysis is extended to the derivation of radiation cross section in a dielectric medium in the limit of no cherenkov radiation (i.e., particle transit time approaching infinity) and for the bremsstrahlung radiation polarization. Finally, the differential cross section in the dielectric medium is integrated 1) over the solid angle of photon emission and 2) over the angle at which secondary electron emission is obtained. Orig. art. has: 31 equations

Card 1/2

L 17974-63
ACCESSION NR: AP3000085

and 2 figures.

ASSOCIATION: Yerevanskiy gosudarstvennyy universitet, Fizicheskiy institut GKAE (Yerevan State University, Institute of Physics)

SUBMITTED: 30Sep62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NO REF SOV: 001 OTHER: 003

Card 2/2

/EEC(k)-2/EEC(t)/T/EEC(b)-2/EWP(k)/EWA(h)/

Turkov,

TOPIC TAGS: laser, continuous wave laser, laser, traveling wave laser

A continuous-wave laser analysis is presented in terms of ... and pump powers as

L 10436-63

Card 2/2

ABSTRACT: A theoret[illegible] [illegible] investigati[illegible] of the nonstationary processes in [illegible]

Card 1/2

L 10433-65

ACCESSION NR AP4046629

ENCL: 00

SUB CODE: EC NO REF SOV: 004 OTHER: 004

TER-MIKAYELYAN, M.L.

Calculating the intensity of a pulse laser. Dokl. AN Arm. SSR 38 no.2:105-110 '64. (MIRA 17:4)

1. Chlen-korrespondent AN Armyanskoy SSR.

TER-MIKAYELYAN, M.L.; MIKAELYAN, A.L.

Theory of light generation in lasers. Dokl. AN SSSR 155 no.6: 1298-1301 Ap '64. (MIRA 17:4)

1. Yerevanskiy gosudarstvennyy universitet. Predstavleno akademikom V.A.Ambartsumyanom.

[illegible] [illegible]AN, B.V.

[illegible] emi[illegible] of fast particles. Dokl. AN Arm. [illegible] 40
no.1:[illegible] '65. (MIRA 18:7)

1. [illegible] radiatsionnaya laboratoriya Yerevanskogo
[illegible] universiteta i Akademii nauk Arm[illegible].
2. [illegible] korrespondent AN ArmSSR (for Ter-Mikayelyan).
[illegible] July 14, 1964.

L 44791-66 EWT(1)/EEC(k)-2/T/EWP(k) IJP(c) WG

ACC NR: AP6031454 SOURCE CODE: UR/0056/66/051/002/0680/0682

47
B

AUTHOR: Mikaelyan, A. L.; Ter-Mikayelyan, M. L.

ORG: Joint Radiation Laboratory, Yerevan State University (Ob"yedinennaya radiatsionnaya laboratoriya Yerevanskogo gosudarstvennogo universiteta); Joint Radiation Laboratory, Academy of Sciences, Armenian SSR (Ob"yedinennaya radiatsionnaya laboratoriya Akademii nauk Armyanskoy SSSR)

TITLE: Transmission of light pulses through a medium with population inversion

SOURCE: Zh eksper i teor fiz, v. 51, no. 2, 1966, 680-682

TOPIC TAGS: laser theory, population inversion, ~~light~~ laser propagation, light pulse

ABSTRACT: Propagation of light pulses through a uniform medium with population inversion was analyzed by means of a system of quasi-classical equations for the case of exact resonance $\varepsilon = 0$ (where $\varepsilon = \omega_0 - \omega$) and by means of the perturbation theory. The regular amplification regime varies sharply if the following condition is not satisfied:

$$\frac{\partial \bar{A}}{\partial x} + \frac{1}{v}\frac{\partial \bar{A}}{\partial t} = \frac{\pi |V| \Delta_0}{\omega} \sin\left(\frac{2|V|}{c\hbar}\int_0^t A\,dt\right),$$

where $\bar{A}(x,t) = \bar{A}(x,t)\exp(ikx - i\omega t) + K$ is the radiation potential vector, v is the light velocity in the medium, Δ_0 is the overpopulation of the medium at t = 0, and |V| is the modulus of the transition element matrix. In this case, the emission intensity

Card 1/2

L 44791-66

ACC NR: AP6031454

has an oscillatory character and the amplification or attenuation effects are suppressed. Orig. art. has: 4 formulas. [YK]

SUB CODE: 20/ SUBM DATE: 08Feb66/ ORIG REF: 005/ OTH REF: 001/ ATD PRESS: 5080

Card 2/2 blg

ACC NR: AP6027243 SOURCE CODE: UR/0109/66/011/008/1518/1520

AUTHOR: Mikaelyan, A. L.; Ter-Mikayelyan, M. L.; Turkov, Yu. G.; D'yachenko, V. V.

ORG: none

TITLE: Use of quasi-classical and balance equations for calculating stationary conditions in lasers

SOURCE: Radiotekhnika i elektronika, v. 11, no. 8, 1966, 1518-1520

TOPIC TAGS: laser theory, laser R and D

ABSTRACT: The calculation of laser-energy characteristics by the conventional balance method is compared with the calculation by a more rigorous method which takes into account the wave interference in the resonator. In the latter method, the field is described by the classical Maxwell equations, and the active atoms, by the Schredinger equation; two opposing waves are considered in an optical resonator formed by two planar mirrors. Curves of radiation intensity vs. output-mirror reflectivity calculated by the two above methods are shown. At the optimal-reflectivity point, the balance equations have a maximum error (25%). With higher pumping levels and longer specimens, the error diminishes. Orig. art. has: 3 figures and 8 formulas.

SUB CODE: 20 / SUBM DATE: 17Feb66 / ORIG REF: 005

Card 1/1 UDC: 621.378.325.001.24